

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/709,996	JANAKIRAMAN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Brian Young	2819	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 3/23/05.
2. ☒ The allowed claim(s) is/are 3-9, 11-46, 49-54 and 57-59.
3. ☒ The drawings filed on 11 June 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

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|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                    |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

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1. Claims 3-9, 11-46, 49-54 and 57-59 are allowed.
2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

In claim 50, line 1, delete "48" and insert – 49 --.

Claim 48 was cancelled in an amendment.

3. The following is an examiner's statement of reasons for allowance: digital codes are generated at the output of a SAR ADC by using multiple reference voltages. A first reference voltage is used to generate an equivalent voltage corresponding to previous resolved bits and a second reference voltage is used to generate equivalent Voltage corresponding to the bits being presently resolved. This is achieved by resolving some of the MSBS of the digital code using a high speed and low SNR DAC and the remaining bits of the digital code using a high SNR DAC. This method, as claimed, has not been shown in the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Melanson 6,844,840 disclose a successive-approximation-register (SAR) analog-to-digital converter (ADC) and method utilizing N three-way

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elements are disclosed. The SAR ADC has a SAR logic system that implements an efficient search algorithm. The search algorithm involves initializing each of N three-way elements of a digital-to-analog converter (DAC) for the SAR ADC to a middle reference voltage. Each of the N three-way elements can be set to one of three values: a high reference voltage, a middle reference voltage, or a low reference voltage. The search algorithm determines and sets each of the N three-way elements from the middle reference voltage to either the high reference voltage or the low reference voltage depending upon a comparison result between an analog input value of the SAR ADC and a DAC voltage value.

Krone, et al 6,167,132 discloses an analog successive approximation (SAR) analog-to-digital converter (ADC) is disclosed that is a compromise between a SAR ADC implementation and a fully parallel thermometer-to-binary ADC. The analog SAR ADC utilizes N comparators for N bits of output and does not require a clock system, control logic, decode logic, or thermometer-to-binary decode circuitry. Conversion speed is determined by the comparator rate, and the comparator outputs may be used directly as the ADC outputs. The analog SAR ADC disclosed is a low complexity, low-precision analog-to-digital converter (ADC) that may be used to digitize phone line status information so that it may be communicated across a isolation barrier as digital information.

Nakajima 5,638,075 disclose an analog/digital (A/D) converter includes a sequential approximation register (SA register) having a plurality of bits for storing the results of conversion in digits and an incrementor having a smaller number of bits than that of the

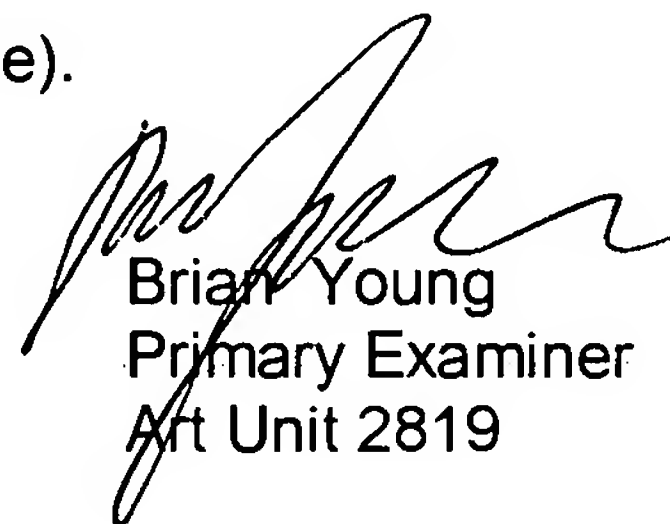
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SA register. The incrementor increments a portion of the results of conversion on the basis of the result of conversion of at least one bit in the SA register so as to minimize an error in the A/D conversion of a smaller number of bits than that of the SA register.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Young whose telephone number is 571-272-1816. The examiner can normally be reached on Mon-Fri 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Tokar can be reached on 571-272-1812. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Brian Young  
Primary Examiner  
Art Unit 2819

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